

University of Dundee

Stakeholder Mapping for Adaptation in Deltas

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Publication date:
2015

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Citation for published version (APA):

Allan, A., Hissen, N., Ghosh, A., Samling, C. L., Tagoe, C. A., Nelson, W., Mensah, A., Salehin, M., Mondal, M. S., & Spray, C. (2015). *Stakeholder Mapping for Adaptation in Deltas: DECCMA Working Paper*. (DECCMA Working Papers).

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Stakeholder Mapping

For Adaptation in Deltas



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Citation:

Allan, A., Hissen, N.F., Ghosh, A., Samling, C.L., Tagoe, C. A., Nelson, W., Mensah, A., Salehin, M., Mondal, Md. S., Spray, C. 2015. WP1 – Stakeholder Mapping Consolidated Fast Track. DECCMA Working Paper, Deltas, Vulnerability and Climate Change: Migration and Adaptation, IDRC Project Number 107642. Available online at: www.deccma.com, date accessed

About DECCMA Working Papers

This series is based on the work of the Deltas, Vulnerability and Climate Change: Migration and Adaptation (DECCMA) project, funded by Canada's International Development Research Centre (IDRC) and the UK's Department for International Development (DFID) through the **Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA)**. CARIAA aims to build the resilience of vulnerable populations and their livelihoods in three climate change hot spots in Africa and Asia. The program supports collaborative research to inform adaptation policy and practice.

Titles in this series are intended to share initial findings and lessons from research studies commissioned by the program. Papers are intended to foster exchange and dialogue within science and policy circles concerned with climate change adaptation in vulnerability hotspots. As an interim output of the DECCMA project, they have not undergone an external review process. Opinions stated are those of the author(s) and do not necessarily reflect the policies or opinions of IDRC, DFID, or partners. Feedback is welcomed as a means to strengthen these works: some may later be revised for peer-reviewed publication.

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1. INTRODUCTION

The DECCMA project aims to develop the understanding and tools needed for sustainable adaptation in deltas. In this context, work package 1 (WP1) primarily aims at devising proper engagement procedures for understanding the capacity of the governance system to support migration and gender-sensitive sustainable adaptation in deltaic environments under changing climate; as well as ensuring that each delta region affords sufficient emphasis on governance and stakeholder engagement. This report focuses on the preparation of stakeholder maps for the four case areas (WT1.1.1).

This report outlines stakeholder engagement activities between 1st October, 2014 – 31st August 2015 undertaken by Work Package 1 (WP1) for each of the four case studies (the Bangladesh Delta, the Indian Bengal Delta, the Mahanadi Delta, and the Volta Delta). The report identifies primary and secondary stakeholders, who are relevant to DECCMA or related issue areas. Primary stakeholders are directly affected by DECCMA (high interest/ high influence) whereas secondary stakeholders are only indirectly affected (high interest/ low influence; low interest/ high influence). Stakeholder maps are produced for each of the four case studies, which show the relative influence and interest of each stakeholder. WP1's methodological approach is based on the idea of Dynamic Stakeholder Mapping (DSM), a concept that is further set out in the Stakeholder Engagement Plan (Allan and Adams 2015), which includes multiple validation rounds and revisions of the map, mirroring DECCMA's project stages and progress.

1.1. Methodological Approach to Stakeholder Mapping

As stated above, WP1 uses a DSM approach. This approach includes multiple rounds of stakeholder mapping, which incorporates stakeholder analysis approaches (Reed et al. 2009, ODA 1995) with theories on multiple learning loops (Hargrove 2002, Pahl-Wostl 2009). There are four rounds of stakeholder engagement planned during the 5 year research DECCMA is undertaking, each round of stakeholder engagement lasting approximately one year. As an outcome of the first round of stakeholder engagement, an initial map of stakeholders was prepared, which identifies relevant stakeholders for the project according to the following criteria:

- Sending and receiving areas
- Governance level (e.g. national, local etc.)
- Degree to which they could potentially influence project agenda
- Degree of interest in the project
- Policy uptake/ post-project follow-up

Key questions for the mapping exercise were:

- Who is/ should be interested in the research topic of the project and its research outcomes?
- Who stands to lose or gain significantly from the project?
- Whose actions could potentially affect the project's success?

Mapping was conducted according to the following method:

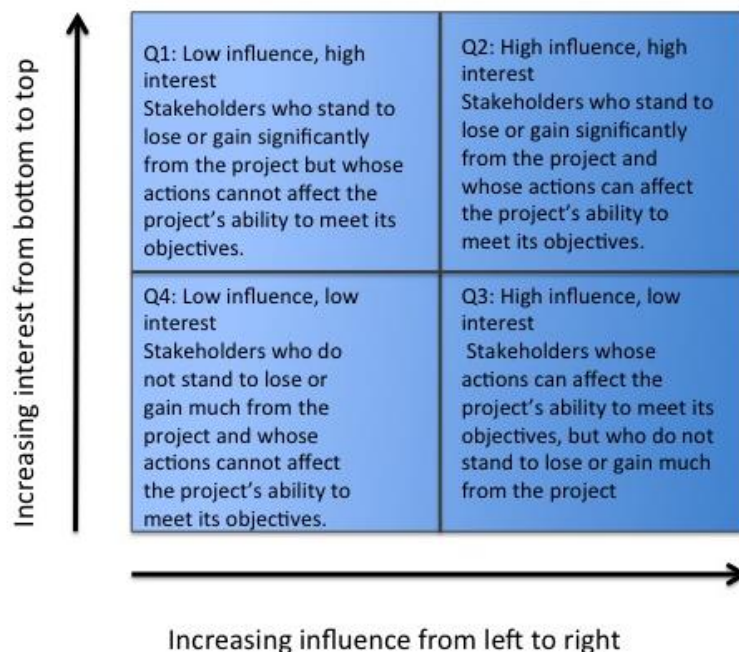


Figure 1: Methodological approach for stakeholder mapping

Each stakeholder was assigned a score for each axis, from 0-5. At this early stage in the project, scoring was done based on existing understanding of the complex adaptation processes in each case study by country partners. This will be refined during future stakeholder engagement events using questionnaires to improve the assessment of stakeholders' influence and interest in regards to DECCMA.

DECCMA aims to successfully engage with stakeholders so that stakeholders with low/medium interest but with higher influence levels will increase their interest in the project and thus hopefully use their influence to bring about positive changes. In addition, interested stakeholders with low influence will be sensitized and their capacity built for better engagement with decision-makers and enhance their own capacity to contribution to the reduction of vulnerability in the delta zone.

1.2. Conceptualization of Stakeholder Engagement

Stakeholders may be persons or groups who are directly or indirectly affected by the project, as well as those who may have an interest in the project and/or the ability to influence its outcome, either positively or negatively. Primary stakeholders are defined by having high influence and high interest in the project, whereas secondary stakeholders have either high interest/ low influence or low interest/ high influence. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organisations and groups with special interests, the academic community, or other businesses. Different projects require different approaches regarding stakeholder engagement, which can change with time. Stakeholders may also need to be engaged in different ways depending on the issues that have been identified. A complete engagement scheme involves interaction with a broad range of stakeholders, from primary stakeholders who have a strong interest in learning and improving development outcomes, to those who are directly or indirectly affected by DECCMA research outcomes. Stakeholder engagement proves mutually beneficial, to DECCMA and its stakeholders. Effective stakeholder engagement enables improved planning and enhances relevance to stakeholders of DECCMA's research outcomes and services. For stakeholders, the benefits of engagement include the opportunity to contribute to the research design and provide important information as experts in their field, as well as have their issues heard and influence decision-making.

1.3. Outline of the report

The following report presents the results of the first round of DSM in each of the four case studies, then compares the maps across the four cases and outlines next steps for round two of stakeholder engagement. Section 2 presents the stakeholder analysis for the Bangladesh Delta. Section 3 and 4 focus on the results from the two Indian case studies, namely the mapping in the Indian Bengal Delta and the Mahanadi Delta. The analysis and results from the Volta Delta

a presented in section 5. The last section compares the four cases, draws preliminary conclusions and outlines the next steps.

2. THE BANGLADESH DELTA

2.1. Introduction

Primary objective of this work task is to establish a gender-sensitive and substantive partnership with relevant stakeholders, such as decision makers at the national policy level and community representatives at a local level.. DECCMA aims to produce policy relevant research, and as a result to provide recommendation to policy makers .With this in mind, a first round of dynamic stakeholder mapping has been conducted to identify relevant stakeholders for the project with a particular focus on relevance for policy uptake and post-project follow up. Stakeholders have been identified based on their background and relevance to the project at this stage, keeping in mind that the identities of primary and secondary stakeholders and their respective influence or levels of interest in the project may change over time and vary across spatial scales. Meetings have been conducted amongst the country team members, which included brainstorming ideas regarding the engagement framework and mapping procedures. Further, organisations from various echelons of government and socio-economic system have been identified as relevant stakeholders to engage with.

2.2. Stakeholder Mapping

Stakeholders were assessed in terms of their respective influence and interest relating to DECCMA, enabling the identification of the most critical groups, institutions and individuals. Matrix prioritising was conducted to determine the relevant importance of each respective organisation and their level of involvement in design and throughout the duration of implementation of project (Appendix A).

For the Bangladesh delta, a total of 65 stakeholders were mapped, plotting their respective values of influence against interest, with increasing influence values from left to right along the x-axis and increasing interest values from bottom up along the y-axis (Figure 2). The influence and interest level of the various organisations were measured on a scale of 0 to 5 based upon the statements outlined in the above figure (Figure 1). A plot was prepared, colour coding the organisations according to sector, e.g national government, private sector, NGOs etc., in order to identify clusters of institutions of similar type.

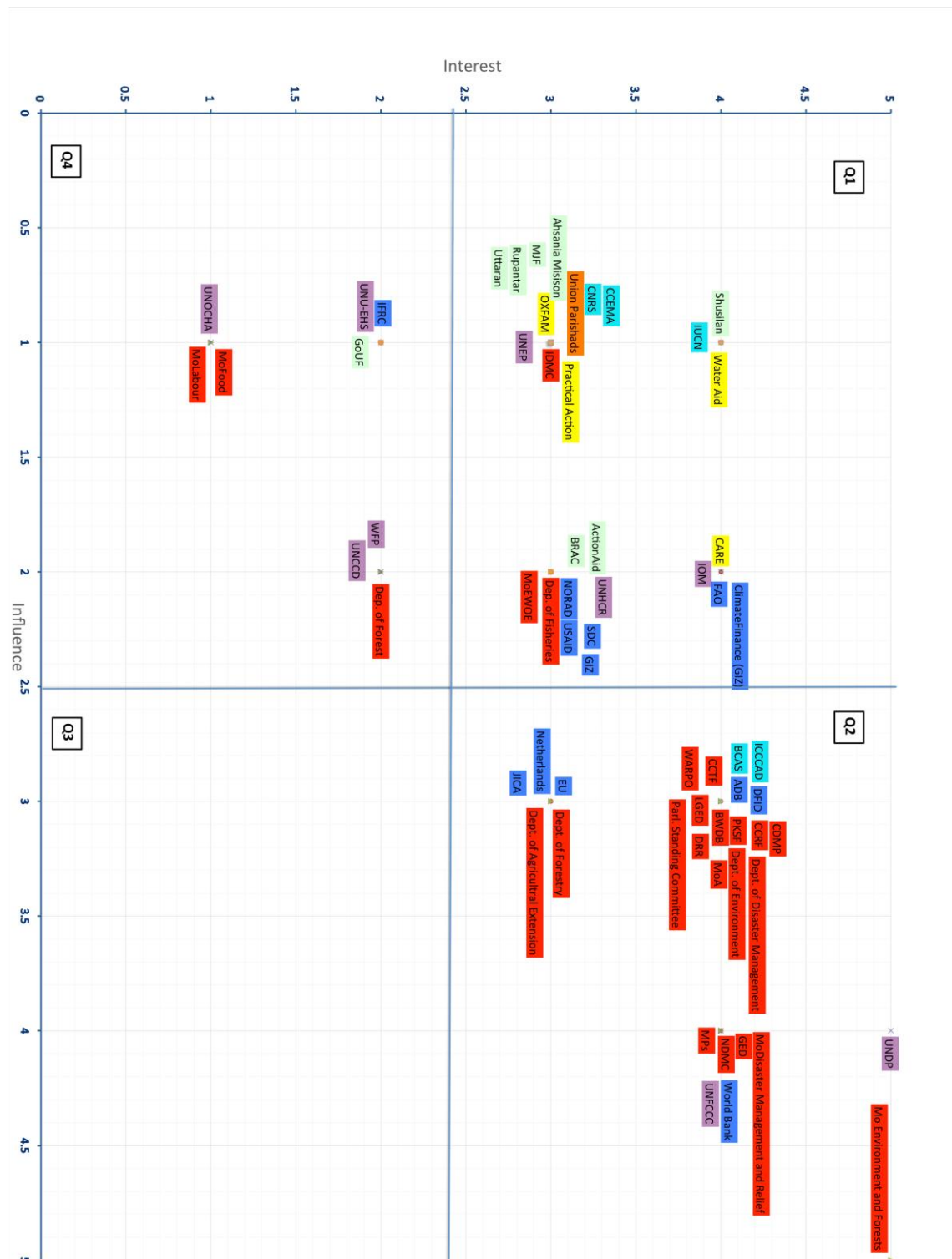


Figure 2: Stakeholder map showing relevant stakeholders in the Indian Bengal Delta

Legend: red= Government (national), orange= government (local), blue = donor, purple= intern. Organisation, yellow= NGO (international), light green= NGO (national), turquoise = research

The stakeholder map is divided into four equal size quadrants, counting clockwise from the top left in accordance with the aforementioned matrix. The four quadrants (Q1-4) rank stakeholders according to the following:

- Q1 – high interest/ low influence
- Q2 – high interest/ high influence
- Q3 – low interest/ high influence
- Q4 – low interest/ low influence

The plot indicates a concentration of stakeholders in Q2 (29 out of 65) with high interest/ high influence and in Q1 (27 out of 29) with values of high interest but low influence. Nine stakeholders are mapped in Q4 (low interest/ low influence) and no stakeholders are located in Q3 with high influence but low interest.

It is interesting to observe that amongst stakeholders in Q2 mainly national government institutions are represented together with a few donor agencies and international organisations. Whereas there are fewer stakeholders placed in Q4, the type of stakeholders in Q2 and Q4 are similar, i.e. national government and international organisations. To understand the processes and mechanisms why certain government actors and international donor agencies have high interest and high influence, why others are at the opposite end (low interest/ low influence) will be one of the guiding questions for the next stakeholder engagement round in Bangladesh.

Regarding the mix of type of stakeholders, Q1 (where the second most stakeholders are located) combines a wide range of stakeholders across different sectors, such as national and international NGOs, national and local governments, donors, international organisations and research. These stakeholders have a high interest in DECCMA, but so far not a great influence in regards to policy uptake and implementation. This is a relevant group for DECCMA to engage with more and understand why their influence is limited, with the aim to enhance their voice and potential future influence for the project.

Out of 65 identified relevant stakeholders, a total of 14 stakeholders engaged at workshops held in the region (compare Appendix A). This translates to direct engagement of DECCMA with 21% of the identified stakeholders. Stakeholders, who attended the workshops, are all located either in Q2 or Q1, and are mostly government institutions, donors or international organisations. In addition, representatives from a national NGO and two other research projects attended the workshops. Type of stakeholders that were missing from the workshop

were local government actors and international NGOs. It will be important to target these in the next round of stakeholder engagement, as well as focus on engagement with national government.

As outlined in the stakeholder engagement report, low attendance of the workshops was caused due to clashing time commitments of important stakeholders. It is hoped that in the next round of stakeholder engagement such issues can be avoided, and engagement of stakeholders can be increased.

As this analysis is based on a preliminary assessment it is expected that the stakeholder map is subject to change, as stakeholders' influence and interests are dynamic both on a temporal and spatial scale.

Key findings:

- Only government actors and international organisations/ donors among stakeholders with high influence and high interests.
- Government actors at opposite ends: either high influence/ high interest or low influence/ low interest.
- Wide range of types of stakeholders that have high interest/ low influence in regards to DECCMA.
- Only 21% of identified stakeholders engaged directly with DECCMA by attending stakeholder workshops.
- Stakeholders that were missing from the workshop were local government and international NGOs, and only few national government actors attended.

The prepared stakeholder map acts as the primary basis upon which the engagement strategy is based. It helps in the identification of the most critical groups and institutions and thus allows the DECCMA to address their needs and concerns. Further, the stakeholder mapping also feeds into the design and results of other work tasks, such as the preparation of the Research into Use and Communication strategies to be best tailored to the needs, capabilities and characteristics of relevant stakeholder. Prioritised aspects of the engagement strategy include exchanging views about current research progress, targeted outputs and their immediate implementation, address issues and demands put forth by various group of stakeholders, and synthesizing the combined results as a whole. The stakeholder mapping is crucial for WPs 3,4, and 6 as a basis for targeting specific stakeholders relevant to their research foci

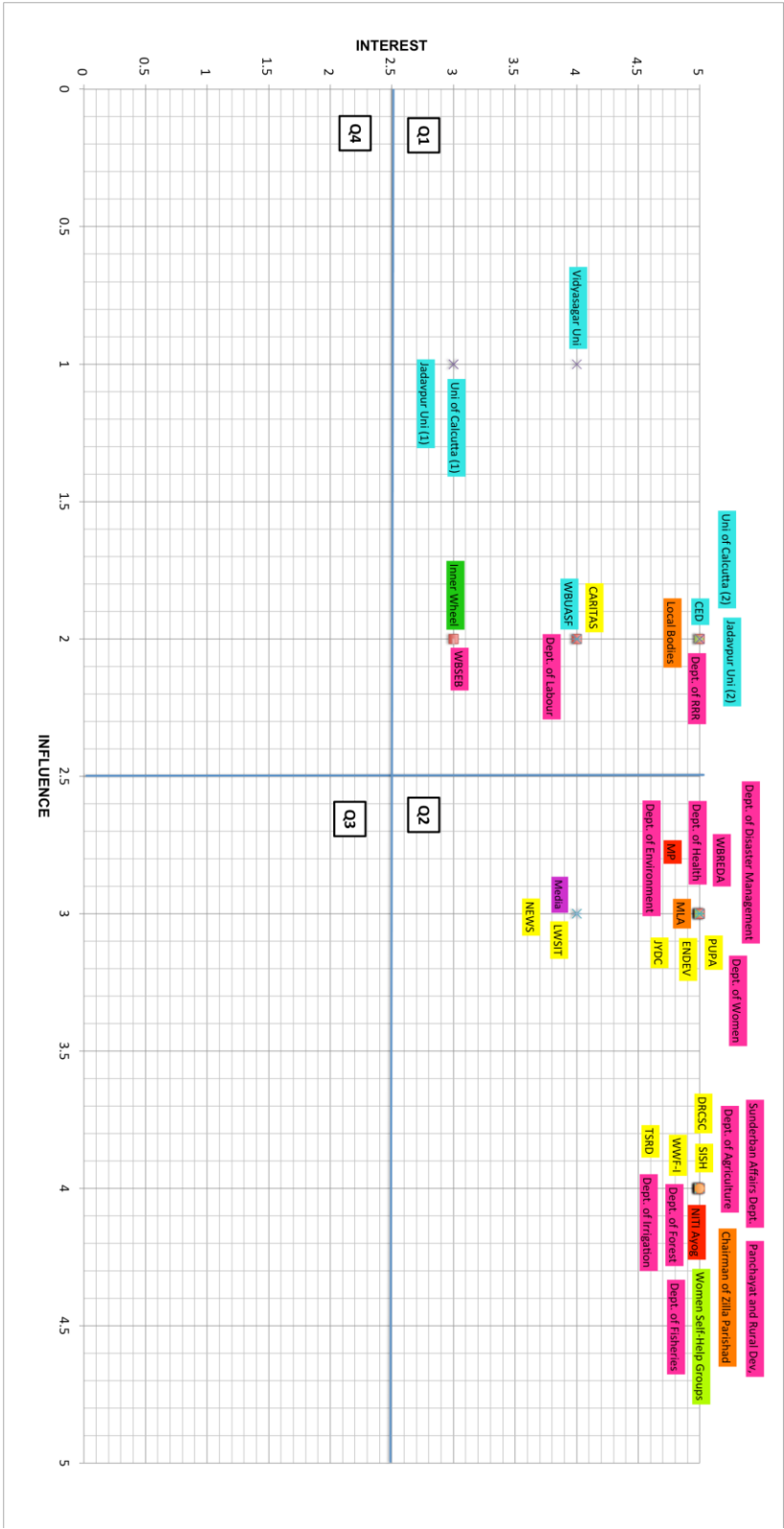
3. INDIAN BENGAL DELTA

The Indian Bengal Delta (IBD), a part of Ganga-Brahmaputra-Meghna basin in Asia, which is shared between India and Bangladesh. The delta is home to an estimated population of 4.2 million, distributed over 19 Community Development (CD) blocks, has an assemblage of Tribals, Scheduled Castes and other Backward classes and present a profile of religious harmony between the Hindus and the Muslims. Parts of the delta form the Sunderbans National Park, which includes the only tidal-habitat of the Royal Bengal Tiger and was declared a World Heritage Site by UNESCO in 1987.

For identifying and mapping stakeholders in the IBD, the same methodological approach was applied as for the Bangladesh Delta, namely stakeholders were assessed according to their interest in DECCMA and their influence on the project, as well as their influence, among others in regards to policy uptake (see section 1.1).

3.1. Stakeholder mapping

Figure 3: Stakeholder Map of the Indian Bengal Delta
Legend: red= government (national), pink= government (state), orange= government (local), yellow= NGO s, light green= civil society, dark green= private sector, purple= media, turquoise = research



A total of 39 stakeholders were mapped, plotting their respective values of influence against interest with increasing influence values from left to right along the x-axis and increasing interest values from bottom up along the y-axis (figure 2). The influence and interest level of the various organisations were measured on a scale from 0 to 5. A plot was prepared, colour coding the organisations according to type, in order to identify clusters of institutions of similar type. The plot shows that all identified stakeholders cluster in Q1 and Q2, thus all have a medium to high (3-5) interest, but vary in the degree of influence (1-5). So far, no stakeholders have been identified with a low interest in the project. This finding is surprising and needs to be further investigated to ensure that there has not been selection bias among the identified stakeholders.

All identified stakeholders are located in the quadrants with high interest. Stakeholders vary according to influence. While some stakeholders in the research sector have a low influence of 1 or 2, particularly state government actors as well as some NGOs have a very high influence of 5. Amongst the stakeholders in Q2 with high influence, mainly national and state government actors are represented. Unexpectedly, there are many national NGOs among actors with high interest and high influence, as well as civil society organisations, such as women self-help groups. In comparison to the other three case studies, it is interesting to note that there are no bilateral donors or international organisations that play a considerable role as important stakeholders. The next round of stakeholder engagement will investigate these preliminary findings further.

Attendance of the stakeholder workshops was relatively high in the IBD. Out of 39 identified stakeholders, 15 attended stakeholder workshops, i.e. 38% of stakeholders (Appendix B). Stakeholders, who are characterised by high interest and high influence attended the workshops, in particular NGOs as well as state government representatives. Furthermore, local government officials and researchers engaged directly with DECCMA during the workshops. However, national government and the private sector were missing from the stakeholder workshop. In addition, no donors or international organisations were represented among important stakeholders. The next round of stakeholder engagement needs to aim for keeping the same stakeholders interested and avoid stakeholder fatigue. Furthermore, stakeholders that have not been reached so far will need special attention and to try and get them engaged. Further details on strategies of stakeholder engagement are outlined in DECCMA's stakeholder engagement plan and Research into Use Strategy.

Key findings:

- All plotted stakeholders have a medium-high interest. No stakeholders identified with low interest.
- Stakeholders with high influence include government actors, but also national NGOs and civil society organisations.
- No international organisations or bilateral donors among relevant stakeholders.
- Stakeholder engagement was high as 38% attended stakeholder workshops.
- Stakeholders representing the national government and the private sector were missing from the engagement so far.

The prepared stakeholder map helped to identify relevant stakeholders, and illustrates their respective interest and influence. The map will inform the engagement and communication strategy for the IBD. Particularly in regards to the communication strategy, establishing links with the media and using multiple means of communication will be important to reach all the relevant stakeholders. To foster continuous engagement with the key actors, the engagement strategy includes exchanging views about current research progress, targeted output and its immediate implementation, address issues and demands put forth by various group of stakeholders, and synthesizing the combined results as a whole. The stakeholder mapping is also crucial for WPs 3,4, and 6 as a basis for targeting specific stakeholders relevant to their research focus.

4. MAHANADI DELTA (India)

4.1. Physical profile

The Mahanadi River Delta in Odisha (India) comprises a network of three rivers, namely the Mahanadi, the Brahmani and the Baitarani. The width of the delta ranges from 15km to 100 km and the delta extends for about 170 km from Bhadrak in the North to Chilika in the South.

The Mahanadi delta has a total population of 6.6 million divided across four districts: Cuttack, Puri, Kendrapara and Bhubaneswar. An analysis of the Census Data to estimate population change in the delta districts shows that in Puri and Cuttack districts population has decreased by 9.84% and 16.97% between 1961-2011 respectively. Possible causes for such population decline include negative socio-economic impacts from climate related events in these coastal districts.

The Mahanadi delta is also home to a unique ecosystem. Here, the Chilika Lake, a Ramsar Site, and the World's largest marine turtle nesting ground, Ghairmata Beach (35 km long) are located in the delta, as well as the largest population of Estuarine Crocodiles in India.

Against this backdrop, the following section presents relevant stakeholders in the Mahanadi delta for DECCMA and maps their interest and influence in the project (see section 1.1).

4.2. Stakeholder mapping

A total of 29 stakeholders were mapped, plotting their respective values of influence against interest, colour coding the organisations according to type, in order to identify clusters of institutions of similar type (figure 3). The plot shows that all identified stakeholders are located either in Q1 or Q2. Therefore all stakeholders have a high interest (4-5) in DECCMA, but vary in the degree of influence. The score for influence ranges from 2-4, thus, some stakeholders have low influence, others have high influence. The stakeholder map of the Mahanadi delta resembles the findings from the Indian Bengal Delta. Further scrutiny is necessary to understand what causes the observed similarities.

Out of 29 identified stakeholders, six stakeholders are placed in Q1 (high interest/ low influence) and 23 stakeholders are in Q2 (high interest/ high influence). In Q2, state government institutions present the dominant stakeholder group, in addition to local and

national government institutions. Further, international organisations, NGOs, the private sector and civil society are all represented among stakeholders with high influence. This mix of type of stakeholders as well as the relatively high number of stakeholders with high influence is an interesting finding and will be investigated further in the second round of stakeholder engagement. In addition, the second round of stakeholder engagement in the Mahanadi will test the results of the dynamic stakeholder mapping further. As no stakeholders with low interest in DECCMA have been identified in the Mahanadi, it seems there might be a selection bias in stakeholder identification. This needs further examination.

8 stakeholders out of 29 attended stakeholder workshops organised by DECCMA in the Mahanadi delta (Appendix D). This relates to an attendance rate of 27%. All stakeholders, which attended the workshop were mapped in Q2, i.e. having high interest and high influence. Mainly, state government representatives engaged directly with DECCMA during the workshops, as well as national NGOs and the private sector. Types of stakeholders that were missing from the workshop include national and local government actors, international organisations, and civil society organisations. Furthermore could the engagement with NGOs be strengthened. Therefore, for the next round of stakeholder engagement, in the Mahanadi delta DECCMA should engage with a more diverse range of stakeholders and raise awareness (and interest) among donor organisation, civil society groups, local government and other research projects.

Key findings:

- All identified stakeholders have a high interest (4-5) in DECCMA. This is similar to the Indian Bengal Delta.
- Stakeholders with high influence are dominated by state government actors, but also include national NGOs and civil society organisations.
- 27% of stakeholders attended DECCMA workshops in the Mahanadi delta.
- Stakeholders that have not been engaged so far include national government, local government, civil society organisations, and international organisations. Engagement with NGOs could be strengthened.

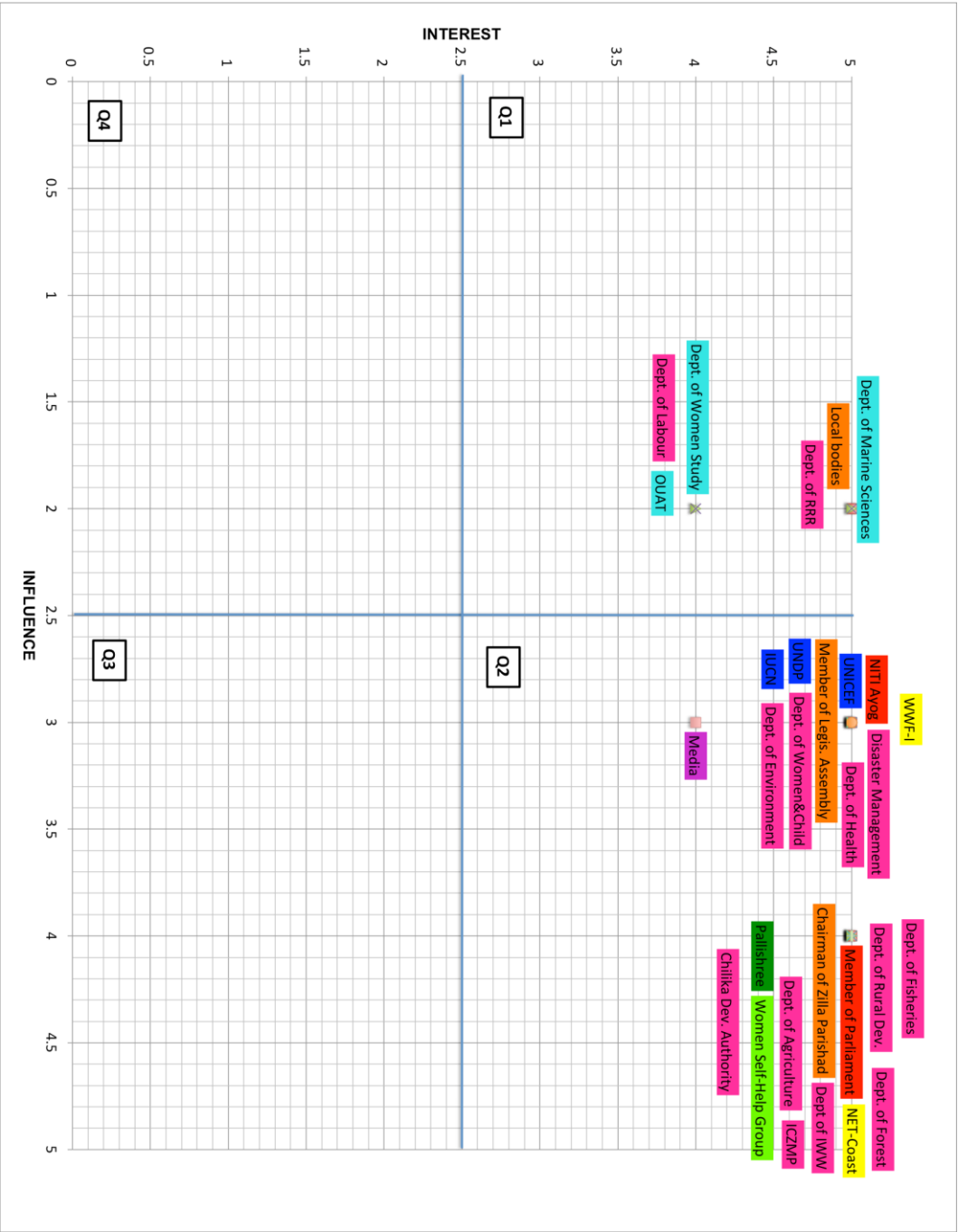


Figure 4: Stakeholder Map of the Mahanadi Delta
Legend: red= government (national), pink= government (state), orange= government (local), blue= intern. Organisations, yellow= NGOs, light green= civil society, dark green= private sector, purple= media, turquoise= research

5. THE VOLTA DELTA (Ghana)

5.1. Introduction

The DECCMA Project in Ghana examines the Volta Delta, its vulnerabilities associated with climate change and the various adaptation options available to inhabitants of the delta with a focus on migration. Geographically, the communities of interest under this project fall within the following districts in the Greater Accra and Volta Regions of Ghana: Ada East and West, Keta, Ketu South, North Tongu, South Tongu and Akatsi South. This section analyses stakeholders, their relevance to DECCMA regarding their interest in and influence on the project..

5.2. Stakeholder Mapping

In the Volta delta a total of 126 relevant stakeholders were identified (figure 4). The majority of stakeholders (109 stakeholders of 126) are situated in Q1 and Q2, i.e. they are perceived to have a high interest in DECCMA, while their influence varies. Out of these 109 stakeholders, 84 stakeholders are placed in Q2 (or 2/3 of all stakeholders), which have a high interest in and high influence on DECCMA. In this group government institutions (national and local) are dominant, though other types of stakeholders are represented, too, such as international organisations and donors, national and international NGOs. Stakeholders active in research are mainly located in Q1, with high interest in DECCMA, but low influence on the project.

Stakeholders with the highest interest and influence score (5/5) are all district chief executives of the 8 districts in the Volta delta.¹ Other influential stakeholders with high interest in DECCMA are Members of Parliament representing the districts, as well as members of the respective District Assemblies. These stakeholders are highly relevant for policy uptake of DECCMA's research results, as well as can have a significant influence on the success of DECCMA's research. To keep these stakeholders engaged and interests will be important for the project's research outcomes.

¹ The map was produced before the re-drawing of the Volta delta for the DECCMA project, which now includes a total of 10 districts.

Compared with the other case studies presented in this report, in the Volta delta the number of stakeholders is much higher and the range of stakeholders is broader than in the other deltas. This high number compared with the other case study areas can be partially explained with the high number of relevant districts (8) in the delta, and thus a wide range of relevant local administration and government. The plot shows that even though politicians at the national level have high influence (4), their interest is comparatively low (3). Politicians at the district level as shown in the stakeholder map have often a higher interest (4 or 5) than national government officials, while they have equal or higher influence. One interesting observation is that local government is perceived as having higher influence on DECCMA than national government. It can be hypothesized that this is due to a more immediate interaction between DECCMA and local government, as national government actors might be more difficult to reach, and more reluctant to engage. The next stakeholder engagement round will pay close attention to this finding and test it further.

In contrast to the other three case studies, in the Volta delta stakeholders are mapped in each of the four quadrants. While most stakeholders have a high interest in DECCMA, two stakeholders have low interest/ high influence (Q3) and 15 stakeholders are classified as low interest/ low influence (Q4). Stakeholders in Q4 are predominantly represent the media, as well as the private sector and research programmes. It is surprising, however, that other research programmes, which in some cases are directly related to DECCMA, such as the ASSAR project, are classified as low interest/ low influence on DECCMA. This will need further testing in the second round of stakeholder engagement.

Out of 126, 20 stakeholders attended DECCMA workshops (Appendix G). The attendance rate of 15% is the lowest across the four case studies. However, in the Volta delta stakeholders mapped in Q2, Q1 and Q4 (low interest/ low influence) engaged directly with DECCMA through the workshops. The Volta delta is the only case study, where stakeholders mapped in Q4 attended workshops. Attendees of the workshops were from local government authorities in the relevant districts, in addition to a few journalists and researchers from other projects. Stakeholders, that were missing from the workshops and which need to be targeted in the future are: national government, international organisations and donors, NGOs, the private sector and possibly identified experts. For the next round of stakeholder engagement, it is therefore

important to increase interest and awareness in DECCMA among the primary stakeholders, and diversify the range of stakeholder, which directly engage with DECCMA.

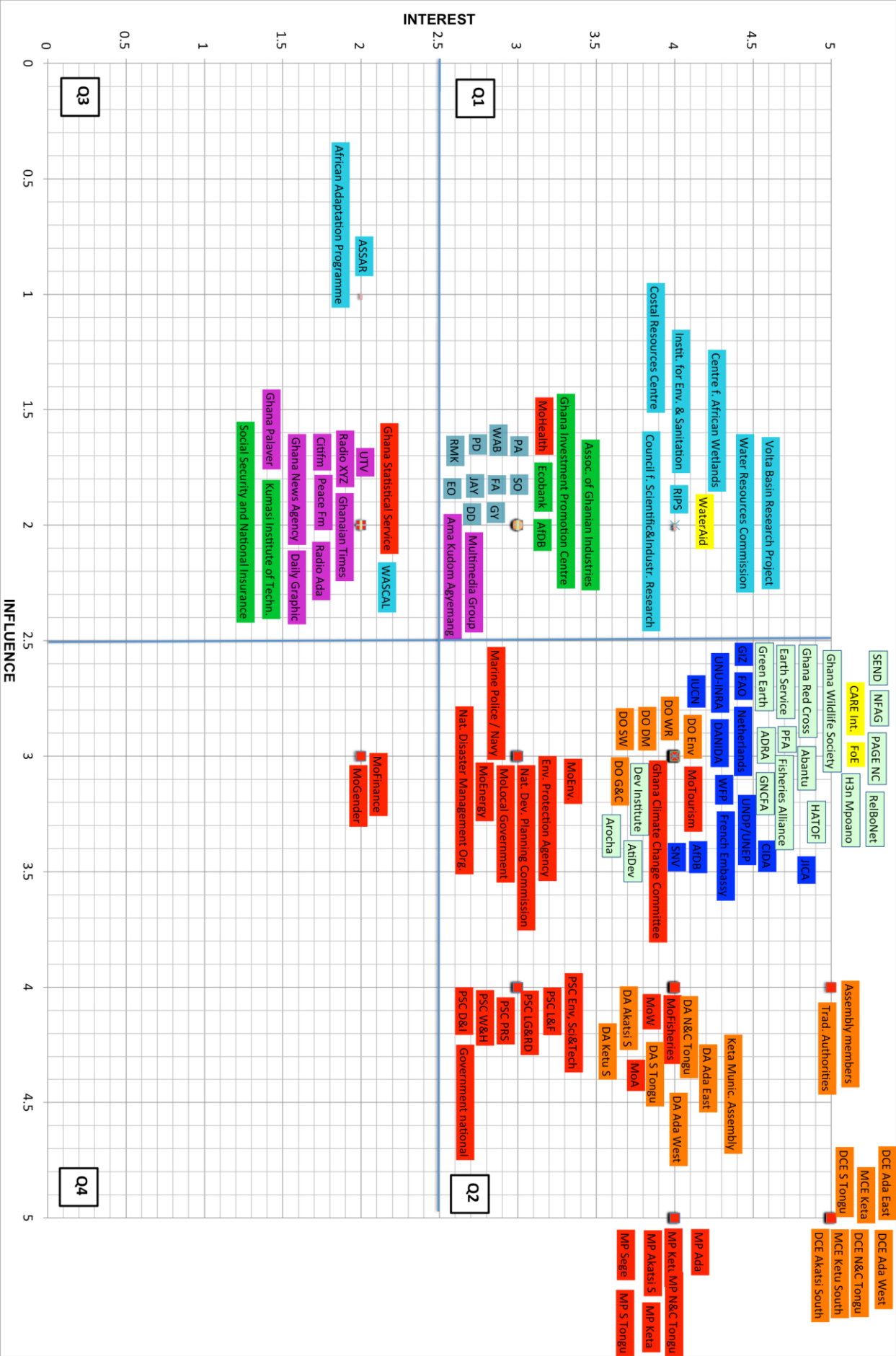


Figure 5: Stakeholder Map for the Volta Delta

Legend: Red= government (national), orange= government (local), dark blue= international organisations/ donors, light blue= experts, light green= NGOs (national), yellow= NGOs (international), dark green= private sector, purple= media, turquoise= research.

Key findings:

- High numbers of relevant stakeholders identified (total of 126). This is partially explained by high number of districts and local government/ administration in the Volta delta.
- 2/3 of stakeholders have high influence/ high interest in DECCMA. These are predominantly politicians, such as District Chief Executives, MPs or District Assembly members.
- Stakeholders identified with low interest/ low influence include mainly media, private sector institutions and research programmes.
- DECCMA engaged directly with only 15% of identified stakeholders.
- Missing from the workshop were stakeholders representing national government, international organisations, donors, NGOs, the private sector and technical experts.

6. CONCLUSIONS

This report presented the results of the mapping of stakeholders across the four case study areas, namely the Bangladesh delta, the Indian Bengal delta, the Mahanadi delta and the Volta delta. For each case study relevant stakeholders were identified. The DSM approach assumes that project understanding of the case study areas will develop over time, and that the respective influence and interest levels of both institutions and individuals may change over time. These changes will take place for a number of reasons – e.g.

- better understanding of the roles of various stakeholders as regards adaptation to climate change;
- improved personal contacts within institutions leading to more precise role delineation;
- clearer definition of survey areas;
- fluid patterns of government funding across agencies and changing policy objectives over time.

It is also hoped that the level of interest of specific stakeholders (those with the highest levels of influence) will increase over the course of the project as the value of the project research outputs and approach is better understood. Finally, it is expected that as stakeholders become increasingly involved in assessing the relative interest and influence of particular institutions and individuals themselves (i.e. through scoring exercises to be held during future engagement events), a more nuanced understanding will be possible. It is clear from the tables contained in the Appendices below that not all stakeholders identified as being relevant were able to attend the engagement events that have taken place thus far. This may be because of:

- a mismatch in perception between the interest/influence scores assigned by project partners and the views of those stakeholders themselves;
- problems with communicating with the relevant individuals within these organisations; or
- low levels of interest on their part with respect to the relevance / utility of project outputs.

The result of the first round of stakeholder mapping are four maps for each of the delta, identifying relevant stakeholder and assigning each an interest and influence level. The maps across the four deltas are very different from each other, and hence comparison is not without difficulty. For example, the number of relevant stakeholders identified in the Mahanadi is 29, whereas in the Volta delta 126 stakeholders have been identified. This is partially in relation to the diverse sizes of the deltas and the number of districts. In particular in the Mahanadi and the Indian Bengal Delta, it appears that stakeholders, who were identified as important for DECCMA all have a high interest in the project. Here, there is the danger of selection bias, as stakeholders with low interest and influence are not as likely to be relevant to the project. In comparison, the Bangladesh delta and the Volta delta each have stakeholders with a low interest or influence in the project. Such differences in the number of relevant stakeholders needs to be reflected in the design and implementation the stakeholder communication strategies for each of the case studies. Furthermore, the visualization of the stakeholder maps might need to be modified in regards of the number of stakeholders displayed (see part 6.1. below).

There are broad similarities across the four case studies in regards to the type of stakeholders, which are deemed important. Mainly, government actors are located in Q2 across all four maps, i.e. having high influence and high interest. This does not come as a surprise, as national governments are responsible for rule-making and policy implementation, and therefore often have great influence. In the Volta delta, though, it seems that the range of stakeholders is wider, than in deltas like the Mahanadi. The stakeholder map of the Volta delta shows many international and national NGOs, as well as local media and international organisations. In contrast, international and donor organisations, which often play an influential role in policy making in developing countries, are not mapped as relevant in the Indian Bangladesh delta. This findings will be explored further in the second round of stakeholder engagement.

In each of the four case studies, government actors were among the key stakeholders. Here, government actors had medium to high levels of influence, as well as interest in DECCMA. However, what differed was the type and administrative level of relevant government institutions. Whereas in the Bangladesh Delta, mainly national government actors seem relevant, in the Indian Bengal Delta state

government actors were the main stakeholders, and in Ghana a mix between national and local government actors played an important role.

6.1. Reflections and next steps

The first round of DSM aimed to identify relevant stakeholders in each of the case study areas, which are important for the work of DECCMA. As this report demonstrated, the stakeholder maps, which were produced for each case study areas, vary greatly – though the Indian Bengal delta and the Mahanadi delta also share great similarities. As was mentioned previously, a number of difficulties were encountered during the first round of stakeholder mapping. For example, it was difficult to motivate some stakeholders to attend the stakeholder workshops and engage with them. This might have resulted in a selection bias of stakeholders and the over or underestimation of interest/ influence in their part.

The proposed matrix for the stakeholder mapping was scored on a scale from 0 to 5. However, as a result for those maps containing high numbers of different stakeholders, such as in the case of the Volta delta and the Bangladesh delta, the resolution was found to be too coarse, which makes the maps crowded and difficult to read. This will be revised in the next round of stakeholder mapping.

A common problem is the high potential for scoring bias of stakeholders. The current maps so far relied on the expert opinion by DECCMA research staff. It seems that this resulted in scoring actors in bulk by sector, or giving rather higher scores for interest and influence, than lower. In order to address the scoring bias in the second round of stakeholder mapping, WP1 proposes to developed clear indicators for interest and influence, and test these via a questionnaire, which will be distributed to stakeholders. Further, the current maps will be presented to stakeholders for comments, which will give better insight into their own perceptions of their interest and influence. The results from the questionnaire in combination with the feedback from the presentation of the maps will be used to revise the stakeholder maps and increase their validity and reliability.

In addition to the revision of the current maps, suggestions also include to devise additional maps according to policy levels, which might de-clutter maps with too many stakeholders, which will make the maps easier to read as well as provide more

in-depth information of relevant stakeholders at a local scale. This can in particular be helpful when linking the maps with the Research into Use Strategy, and thus being able to target and engage with specific stakeholders at the local level.

Furthermore, data from the first round of stakeholder mapping needs to be triangulated with the results from other work packages, for example WP6 to validate the maps, thus creating robust results. This might also include making another set of stakeholder maps, where stakeholders are scored and mapped according to their adaptation activities, which then links to the adaptation inventory produced by WP6. Additional mapping exercises will be conducted annually for the duration of the project, with additional granularity being elicited from spatially disaggregated mapping.

7. APPENDICES

7.1. Appendix A: Stakeholders in the Bangladesh Delta

Serial	Stakeholder	Type	Level	Where Relevant		Influence	Interest	Attended Stakeholder workshop (Y/N)
				Relevant to Sending Areas	Relevant to Receiving Areas			
1	Comprehensive Disaster Management Programme (CDMP)	Government (National)	National	Yes	No	3	4	N
2	DFID	Donor	National (and Regional)	Yes	Yes	3	4	N
3	EU	Donor	National	Yes	Yes	3	3	N
4	Swiss Agency for Development and Cooperation (SDC)	Donor	National	Yes	Yes	2	3	N
5	Norwegian Agency for Development Cooperation (NORAD)	Donor	National	Yes	Yes	2	3	N
6	FAO	Donor	National	Yes	Yes	2	4	N
7	ADB	Donor	National (and Regional)	Yes	Yes	3	4	N
8	World Bank	Donor	National (and Regional)	Yes	Yes	4	4	N
9	International Federation of the Red Cross (IFRC)	Donor	National	Yes	Yes	1	2	N
10	Embassy of Kingdom of Netherlands	Donor	National	Yes	Yes	3	3	N
11	USAID	Donor	National	Yes	Yes	2	3	N
12	German Development Cooperation	Donor	National	Yes	Yes	2	3	Y

	(GIZ)							
13	Climate Finance and Governance, German Development Cooperation (GIZ)	Donor	National	Yes	Yes	2	4	Y
14	JICA	Donor	National (and Regional)	Yes	Yes	3	3	Y
15	Members of Climate Change Trust Fund (CCTF)	Government (National)	National (and Regional)	Yes	Yes	3	4	N
16	Climate Change Resilience Fund (CCRF)	Government (National)	National (and Regional)	Yes	Yes	3	4	N
17	Palli Karma-Sahayak Foundation (PKSF)	Government (National)	National and Regional	No	Yes	3	4	Y
18	Union Parishads (UPs)	Government (Local)	Regional	Yes	Yes	1	3	N
19	International Organisation for Migration (IOM)	International Organisation	National	No	Yes	2	4	Y
20	UNDP	International Organisation	National (and Regional)	Yes	Yes	4	5	Y
21	World Food Programme, UN	International Organisation	National	Yes	Yes	2	2	N
22	United Nations Institute for Environment and Human Security (UNU-EHS)	International Organisation	National	Yes	Yes	1	2	N
23	United Nations Environment Programme (UNEP)	International Organisation	National	Yes	No	1	3	N
24	United	International	National	Yes	No	2	2	N

	Nations Convention to Combat Desertification and Drought (UNCCD)	International Organisation						
25	United Nations Framework Convention on Climate Change (UNFCCC)	International Organisation	National	Yes	No	4	4	N
26	United Nations High Commissioner for Refugees (UNHCR)	International Organisation	National	No	Yes	2	3	N
27	United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA)	International Organisation	National	No	Yes	1	1	N
28	BWDB	Government (National)	National and Regional	Yes	Yes	3	4	N
29	LGED	Government (National)	National and Regional	Yes	Yes	3	4	Y
30	Practical Action	NGO International	National (and Regional)	Yes	Yes	1	3	N
31	Water Aid	NGO International	National (and Regional)	No	Yes	1	4	N
32	OXFAM	NGO International	National (and Regional)	Yes	Yes	1	3	N
33	CARE	NGO International	National and Regional	No	Yes	2	4	N
34	Ahsania Mission	NGO National	Regional	No	Yes	1	3	N
35	BRAC	NGO	National	Yes	Yes	2	3	N

		National	/ Regional (Sub-National)					
36	ManusherJonnno Foundation (MJF)	NGO National	Regional	Yes	Yes	1	3	N
37	GonoGobeshona Unnayan Foundation (GoUF)	NGO National	Regional	No	Yes	1	2	N
38	Shushilan	NGO National	Local	Yes	Yes (Khulna / Barisal etc.)	1	4	Y
39	Rupantar	NGO National	Regional	Yes	Yes	1	3	N
40	ActionAid	NGO National	National and Regional	Yes	No	2	3	N
41	Uttaran	NGO National	Regional	Yes	Yes	1	3	N
42	Parliament Standing Committee	Government (National)	National	Yes	Yes	3	4	N
43	Ministry of Environment and Forests	Government (National)	National	Yes	Yes	5	5	N
44	Ministry of Disaster Management and Relief	Government (National)	National	Yes		4	4	N
45	Ministry of Food	Government (National)	National	Yes	Yes	1	1	N
46	Department of Disaster Management	Government (National)	National / Regional (Sub-National)	Yes	No	3	4	Y
47	Department of Environment	Government (National)	National	Yes	No	3	4	N
48	Ministry of Agriculture	Government (National)	National	No	Yes	3	4	N
49	Department of Forestry	Government (National)	National	Yes	No	3	3	Y
50	Ministry of Labor	Government (National)	National	No	Yes	1	1	N
51	Ministry of	Government	National	No	Yes	2	3	N

	Expatriates, Welfare and Overseas Employment	t (National)						
52	Planning Commission (GED)	Government (National)	National	Yes	Yes	4	4	N
53	WARPO	Government (National)	National	Yes	Yes	3	4	Y
54	Internal Displacement Monitoring Centre (IDMC)	Government (National)	Regional	Yes	No	1	3	N
55	National Disaster Management Council (NDMC)	Government (National)	National	Yes	No	4	4	N
56	Directorate of Relief and Rehabilitation (DRR)	Government (National)	National	No	Yes	3	4	N
57	Department of Fisheries	Government (National)	National	Yes	Yes	2	3	Y
58	Department of Forest	Government (National)	National	Yes	No	2	2	Y
59	Department of Agricultural Extension	Government (National)	National	No	Yes	3	3	N
60	MPs of vulnerable hotspots	Government (National)	Local	Yes	Yes	4	4	N
61	International Center for Climate Change & Development (ICCCAD) [ARCAB]	Research (National)	National	Yes	No	3	4	N
62	Climate Change, Environment and Migration Alliance (CEMA)	Research (International)	National	Yes	Yes	1	3	N
63	IUCN	Research (International)	National	Yes	Yes	1	4	N
64	Bangladesh Center for	Research (National)	National and	Yes	Yes	3	4	Y

	Advanced Studies (BCAS)		Regional					
65	Center for Natural Resources Study (CNRS)	Research (National)	Regional (Sub-National)	Yes	Yes	1	3	Y

7.2. Appendix B: Stakeholder table from the Indian Bengal Delta

Identity and brief description of relevance of each stakeholder, along with an indication of whether they are relevant to sending or receiving areas:

Serial	Stakeholder	Type	Level	Areas Where Relevant		Influence	Interest	Attended Stakeholder workshop (Y/N)
				Relevant to Sending Areas	Relevant to Receiving Areas			
	Member of Parliament (MP)	Government	National	Yes	Yes	3	5	N
	Member of Legislative Assembly (MLA)	Government	District	Yes	Yes	3	5	Y
	Chairman of Zilla Parishad	Government	District	Yes	Yes	4	5	N
	Local Bodies/Authority	Government	Block/Local	Yes	No	2	5	Y
	NITI Ayog*	Government	National	No	No	4	5	N
	Sundarbans Affairs Department	Government	State	Yes	Yes	4	5	Y
	Agriculture Department	Government	State	Yes	Yes	4	5	N
	Fisheries Department	Government	State	Yes	No	4	5	N
	Forest Department	Government	State	Yes	No	4	5	Y
	Irrigation and Waterways Department	Government	State	Yes	No	4	5	N
	Panchayat & Rural development	Government	State	Yes	Yes	4	5	N
	Women & Child Development	Government	State	Yes	No	3	5	N
	Health & Family Planning	Government	State	No	Yes	3	5	N
	Environment	Government	State	Yes	No	3	5	N
	Dept. of Refugee, Relief &	Government	State	Yes	Yes	2	5	N

	Rehabilitation							
	Dept. of Labour	Government	State	Yes	Yes	2	4	N
	WBREDA	Government	State	Yes	Yes	3	5	N
	WBSEB	Government	State	Yes	Yes	2	3	N
	Dept. of Disaster Management	Government	State	Yes	Yes	3	5	Y
	School of Oceanography, Jadavpur University	Research	State	Yes	Yes	2	5	Y
	Dept. of Marine Science, University of Calcutta	Research	State	Yes	No	2	5	N
	School of Environmental Science, Jadavpur University	Research	State	Yes	No	1	3	Y
	Dept. of Geography, Vidyasagar University	Research	State	Yes	No	1	4	N
	WBUASF	Research	State	Yes	No	2	4	N
	Dept. of Geography, University of Calcutta	Research	State	Yes	No	1	3	N
	CARITAS (NGO)	Research	State	Yes	No	2	4	Y
	Centre for Environment & Development	Research	State	Yes	Yes	2	5	Y
	WWF-I	NGO	Local	Yes	No	4	5	Y
	TSRD	NGO	Local	Yes	No	4	5	Y
	ENDEV	NGO	Local	Yes	Yes	3	5	Y
	PUPA	NGO	Local	Yes	No	3	5	N
	NEWS	NGO	Local	Yes	No	3	4	N

	DRCSC	NGO	Local	Yes	No	4	5	N
	SISH	NGO	Local	Yes	No	4	5	N
	LWSIT	NGO	Local	Yes	No	3	4	Y
	JYDC	NGO	Local	Yes	No	3	5	Y
	Women Self Help Groups	Civil society	Local	Yes	No	4	5	Y
	Media	Media	Local	Yes	Yes	3	4	Y
	Inner Wheel	Private Sector	District	Yes	No	2	3	N

7.3. Appendix C: Communication strategy for the Indian Bengal Delta

Sl.No.	Category	Communication method	Purpose of engagement
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<input type="checkbox"/>	Politicians	Telephone/Email	To impress upon need for Action for Adaptation in consonance with the objective of DECCMA.
<input type="checkbox"/>	Government Departments	Telephone/Email	To motivate to implement Disaster Management Plan, Early Warning System, Construction of Rescue Shelters and implement Climate Action Plan of the State (Sundarban sub-sector), following major objectives of the project.
<input type="checkbox"/>	Local Bodies/Authorities	Telephone/Email	To take necessary action at the local level for Adaptation and to assist in Planned Migration, if unavailable, as a part of the DECCMA project study.
<input type="checkbox"/>	Academic/Research Groups	Telephone/Email	To highlight through continuous

			research, current situation and sensitize the policy makers on the need for action, as an input to the ongoing DECCMA exercise.
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	(l)NGOs	Telephone/Email/Print media/Flyers/Social media	To undertake awareness programme amongst the communities on Climate Change impact and also help community in the process of Adaptation, in consonance with the major goals of the DECCMA project.
	Women Self Help Groups	Telephone/Email/Print media/Flyers/Social media	To create an enabling environment for the women to cope up with the Climate Change Adaptation and also to maintain the family unit in case of male migration, in tune with the objective of Gender Equity in the DECCMA project.
	Media	Email/Telephone//Press Conference	To reach wider readership by publication periodic results of the DECCMA project.

	Private Group	Telephone/Email/Print media/Flyers	To make the members aware about vagaries of Climate Change, need for Adaptation and impress of need for external assistance in the process of Adaptation, especially focusing on the women.
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7.4. Appendix D: Identified stakeholders in the Mahanadi Delta

Identity and brief description of relevance of each stakeholder, along with an indication of whether they are relevant to sending or receiving areas;

Serial	Stakeholder	Type	Level	Areas Where Relevant		Influence	Interest	Attended Stakeholder workshop (Y/N)
				Relevant to Sending Areas	Relevant to Receiving Areas			
1.	Member of Parliament	Government	National	Yes	Yes	3	5	N
2.	Member of Legislative Assembly	Government	District	Yes	Yes	3	5	N
3.	Chairman of Zilla Parishad	Government	District	Yes	Yes	4	5	N
4.	Local Bodies/Authorities	Government	Block/Local	Yes	Yes	2	5	N
5.	NITI Ayog	Government	National	No	No	4	5	N
6.	Chilika Development Authority	Government	State	Yes	No	4	5	Y
7.	Disaster Management	Government	State	Yes	Yes	3	5	Y
8.	Agriculture Department	Government	State	Yes	Yes	4	5	N
9.	Fisheries Department	Government	State	Yes	No	4	5	Y
10.	Forest Department	Government	State	Yes	No	4	5	Y
11.	Irrigation and Water ways Department	Government	State	Yes	No	4	5	Y
12.	Panchayat and Rural development department	Government	State	Yes	Yes	4	5	N
13.	Dept. of Women & Child	Government	State	Yes	No	3	5	N
14.	Health and Family Planning	Government	State	Yes	No	3	5	N

	Department							
15.	Environment Dept.	Government	State	Yes	Yes	3	5	Y
16.	Dept. of Refugee, Relief & Rehabilitation	Government	State	Yes	Yes	2	5	N
17.	Dept. of Labour	Government	State	Yes	Yes	2	4	N
18.	ICZMP	Government	State	Yes	Yes	4	5	Y
19.	Department of Marine Sciences, Berhampur University	Research	State	Yes	No	2	5	N
20.	Department of Women Study, Utkal University	Research	State	Yes	Yes	2	4	N
21.	OUAT	Research	State	Yes	No	2	4	N
22.	WWF-I	NGO	State/District	Yes	No	3	5	N
23.	IUCN	INGO	State/District	Yes	Yes	3	5	N
24.	UNDP	INGO	State/District	Yes	Yes	3	5	N
25.	UNICEF	INGO	State/District	Yes	Yes	3	5	N
26.	NET-Coast*	NGO	Local	Yes	Yes	4	5	Y
27.	Pallishree	NGO	Local	Yes	Yes	4	5	N
28.	Women Self Help Groups	Civil Society	Local	Yes	No	4	5	N
29.	Media	Media	Local	Yes	Yes	3	4	N

7.5. Appendix E: Communication strategy for the Mahanadi Delta

Sl.No.	Category	Communication method	Purpose of engagement
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	Politicians	Telephone/Email	To impress upon need for Action for Adaptation in consonance with the objective of DECCMA.
	Government Departments	Telephone/Email	To motivate to implement Disaster Management Plan, Early Warning System, Construction of Rescue Shelters and implement Climate Action Plan of the State (Sundarban sub-sector), following major objectives of the project.
	Local Bodies/Authorities	Telephone/Email	To take necessary action at the local level for Adaptation and to assist in Planned Migration, if unavailable, as a part of the DECCMA project study.
	Academic/Research Groups	Telephone/Email	To highlight through continuous research, current situation and sensitize the policy makers on the need for action, as an input to the ongoing DECCMA exercise.
	(I)NGOs	Telephone/Email/Print media/Flyers/Social media	To undertake awareness programme

			amongst the communities on Climate Change impact and also help community in the process of Adaptation, in consonance with the major goals of the DECCMA project.
	Women Self Help Groups	Telephone/Email/Print media/Flyers/Social media	To create an enabling environment for the women to cope up with the Climate Change Adaptation and also to maintain the family unit in case of male migration, in tune with the objective of Gender Equity in the DECCMA project.
	Media	Email/Telephone//Press Conference	To reach wider readership by publication periodic results of the DECCMA project.

7.6. Appendix F - Profiles of Districts in the Volta Delta

Keta Municipal

According to 2010 Population and Housing Census, Keta Municipal has a population of 147,618. This was made up of 68,556 (46.4%) males and 79,062 (53.6%) females.

It has a total fertility rate of 3.1 and is ranked as the fourth largest district in the Volta Region of Ghana. The district is 53.3 percent urban with Keta as the capital. The Keta Municipal was carved out of the former Anlo District, which comprised Akatsi and Ketu Districts and the Assembly was established by the Establishment Instrument (L.I.) 1868 of 2007.

The Municipality lies within Longitudes 0.30E and 1.05W and Latitudes 5.45N and 6.005S. It is located east of the Volta estuary, about 160 kilometres to the east of Accra, off the Accra-Aflao main road. It shares common borders with Akatsi South District to the north, Ketu North and South Districts to the east, South Tongu District to the west and the Gulf of Guinea to the south. Out of the total surface area of 1,086 square kilometres, approximately 362 square kilometres (about 30 per cent) is covered by water bodies. The largest of these is Keta Lagoon, which is about 12 km at its widest section and 32km long and happens to be the largest lagoon in Ghana. The municipality is a low-lying coastal plain with the highest point of 53 metres above sea level and the lowest between 1 to 3.5 metres below sea level there by making it vulnerable to tidal waves and sea erosion.

The district is mainly an agricultural society with the majority of the population engaged in crop farming, livestock keeping, fishing and other related trading activities including a wide range of industrial activities grouped into agro-based, wood-based (carpentry, standing brooms) mostly operating as sole proprietorships.

South Tongu District

The South Tongu district is located in the southern part of the Lower Volta Basin and bounded to the north by Central and North Tongu Districts, to the east by Akatsi South District, to the west by Ada East District of the Greater Accra Region and to the south by Keta Municipal. The district has a total land area of 594.75 square kilometres and lies between latitudes 6°10'N, 5°45'N and longitudes 30°30'W, 0°45'W, with a population of 87,950, of which 45.5 percent were males. With a population density of about 109 persons per square kilometer, the district has many communities along the major roads and a few of its communities have a good road network. The population however is sparse in the north eastern and south eastern parts of the district.

The district is generally low lying by virtue of its location within the coastal plain, but rises gradually to a height of 75 metres above sea level. The underlying rocks in the district are metamorphic in origin and mainly consist of gneiss and schist's. The district is drained mainly by the Volta River, which runs along the district's western boundary with Ada East District. There are also numerous streams, which run across the district; prominent among them are the Chinwi and Todzi, with a number of lagoons in the southern section. Notable among these lagoons is the Avu lagoon located east of Dabala. The lagoons account for the marshy nature of the landscape in the southern section.

About 52 percent of the active population in the district are engaged in agriculture. The district abounds in potentials for large-scale production of rice with two large-scale rice productive firms already in the district. While livestock and fishing are already practised on a large scale, the potential of large-scale sugar cane cultivation also exists. Other food crops cultivated in the district are maize, cassava, tomatoes and okro with chilli pepper as the main cash crop.

North Tongu District

The North Tongu District is located along the Volta River and has majority of its communities interspersed along the River. The district has a total land size of about 1,131.64 square kilometres representing six percent of the total land area of the Volta Region. The district has a vast arable land available for agricultural

development. The district lays within latitudes 5°47'N to 6°N and longitude 0°5' E to 0°45'E and shares boundaries with Central Tongu to the East, Ada East to the West, South Tongu to the South and Asuogyaman to the North. The main water body watering the North Tongu District is the Volta River. The District is also drained by the Alabo, Kolo, Aklakpa, Gblor, Bla (Bla-Battor), Anyorgborti (Aveyime) and Nyifla streams and their numerous tributaries into the Volta River, which runs North – South through the District. In the rainy season, these streams overflow their banks, causing damage to roads and farms. Channeling, diversion, basin clearing or other means of correction could re-drain large areas of agricultural lands and boost agricultural production. There are large numbers of inland creeks including Anyorgborti and Aklamadawu, Bla which could be developed into fish breeding grounds

With its total population of 87,950 consisting of 54.5 percent females, the district is predominantly rural (87.1%) and an agrarian economy with more than half (57.2%) of its employed population engaged in skilled agricultural forestry and fishery and 15.3 percent involved in service and sales.

Majority of the employed population who engage in skilled agriculture and fishery are women constituting 53 percent as compared to 47 percent males. Similarly, there are more females (4,441) than males (971) engaged in service and sales.

Ketu South District

The Ketu South District is one of the twenty-five districts in the Volta Region and is located at the south-eastern corner of Ghana. It shares its eastern border with the Republic of Togo, the west with Keta Municipality, the north with Ketu North District and on the south is the Gulf of Guinea. The district has a total land size of approximately 779 square kilometres representing 3.8 percent of the regional land area and lies within latitudes 6°03'N and 6°10'N, and longitude 1°6'E and 1°11'E. The district is strategically located with added advantage as the Eastern Gateway to Ghana where continuous cross-border activities are carried out on daily basis.

The population of the Ketu South District (160,756) constitutes 7.6 percent of the population of the Volta Region and has more females (52.9%). With the growth rate of 1.9 percent, the population is projected to increase to 183,624 by December 2017.

The high population growth in the municipality is largely attributed to the influx of immigrants mainly from the nearby countries: Togo, Benin, Nigeria and Niger who engage in commercial activities in the district.

Ketu South Municipality is a relatively low land area with altitudes ranging from less than 15 metres at the coast and increasing to 66 metres inland. The coastline is fairly smooth and marked by sandbars. The Municipality is drained by the Gulf of Guinea which stretches along the whole of the southern part of the district. Another noticeable phenomenon in the district is that about 30 kilometres stretch of lagoon, extending from the Keta lagoon at Blekusu to the environs of Aflao also exist to provide opportunity for aquaculture activities, eco-tourism, development of green belt and salt mining.

The municipality is dominated by an agrarian economy with almost 60 percent of the population in agriculture, fishing and commerce. The occupational areas are classified into agriculture employing directly over 42.7 percent. Fisheries dominates the agricultural sector with the other two sub-sectors being crop and livestock. About 98 percent of the total farmlands in the district are under subsistence food crops production involving maize, cassava and vegetables. The rest of the farmland is devoted to the cultivation of non-traditional cash crops mainly; mango and chili pepper which are for export.

Akatsi South District

The Akatsi South District was established by a Legislative Instrument (L. I.) 2165 on March 15, 2012. It is located between latitudes 6°S 7°N and longitudes 0°W 1°E. It shares boundaries with Keta Municipal Assembly to the South, Ketu North to the East, to the West by South Tongu District and to the North by Akatsi North District. Its total land area is about 536 square kilometres with the capital at Akatsi

The topography of the district generally is undulating with a general elevation of the land averaging 10 to 50 metres above sea level, and a peculiar coastal savannah soil, ground water laterite and tropical black earth. The district is a low-lying coastal plain with flat land in the south and rolling plain to the north. About 60 percent of the total land area lies below 100 feet contour line and rising to cover over 200 feet in the

northern parts. Rivers, such as Tordzi, Agblegborloe, Wowoe, Lotor and Kutoe, drain the district. The first three empty their waters into the Keta and Avu lagoons. Some of these are dammed for irrigation during the dry season.

The agriculture sector is the leading employer of the district work force and is mainly at subsistence level. This accounts for 75.5 percent of the total labour force compared with the national figure of 49.2 percent. Those in commerce form 18.3 percent and the service sector and industry were 3.5 percent and 2.7 percent respectively. The industrial activities in the district are agro-based, wood-based, mining and quarrying, textile, vocational and coconut oil-extraction based.

Ada East District

The Ada East District is situated in the eastern part of the Greater Accra Region. The total land area of 289, 783 square kilometres has a population of 71,671 with 47.5 percent males. The district shares common boundaries with the Central Tongu district to the North, South Tongu and Ada West to the East and West respectively. It is bounded to the South by the Gulf of Guinea which stretches over 18 kilometres from Kewunor to Totope. It is also bounded by the Volta-River South-Eastwards extending to the Gulf of Guinea Southward thereby forming an Estuary, about 2 kilometres away from the district capital, Ada-Foah. The district forms the central portions of the Accra plains. The relief is generally gentle and undulating, a low plain with heights not exceeding 60 metres above sea level. The prominent relief feature include the Todjeh boulders rising about 240 metres above sea level. The general drainage pattern of the Ada East district can be described as dendritic with some of the streams taking their source from the Volta River. The district is predominantly rural (68.3%) with an agrarian economy

Ada West District

The Ada West District covers a total land area of 454 square kilometres sharing boundary with North Tongu to the north, Ningo-Prampram to the west, Ada East to the east and Gulf of Guinea to the south. The district is predominantly rural (70.3%).

The population of the district in 2010 was 59,124 with women representing 51.7 percent of the total population. Predominantly, the indigenous people in the Ada West District are farmers and fisher folks. Most of them – peasant farmers – engage directly in the production of vegetables: onions, pepper, tomatoes and root tubers such as cassava. Majority of the youth, especially are diverting into the cultivation of water melon on large scale. This has intensified the sprinkler system of irrigation farming in the district.

Fishing is also done on a large scale. In some circumstances, when the fishing stock is perceived to be depreciating, fisher folks move towards neighboring countries such as Togo, and travel as far as Ivory Coast and Cameroon to continue their fishing expeditions. The weaving industry engages the majority of the women for sustained household income. Weaving of mats, baskets, local fans, straw bags are the common local activities of most of the rural women. There are major salt mining industries in the district. Most of these industries are private-owned and became well-established partly through partnership agreements.

7.7. Appendix G: Deccma Ghana Stakeholders Influence-Interest Matrix In Receiving And Sending

Serial	Stakeholder	Type	Level	Areas Where Relevant		Influence	Interest	Attended Stakeholder workshop (Y/N)
				<i>Relevant to Sending Areas</i>	<i>Relevant to Receiving Areas</i>			
1	Chair and Ranking Member, Parliamentary Select Committee on Environment, Science & Technology	Politician	National	Yes	Yes	4	3	N
2	Chair and Ranking Member, Parliamentary Select Committee on Lands and Forestry	Politician	National	Yes	Yes	4	3	N

3	Chair and Ranking Member, Parliamentary Select Committee on Poverty Reduction Strategy	Politician	National	Yes	Yes	4	3	N
4	Chair and Ranking Member, Parliamentary Select Committee on Works and Housing	Politician	National	Yes	Yes	4	3	N
5	Chair and Ranking Member, Parliamentary Select Committee on Defence and Interior	Politician	National	Yes	Yes	4	3	N
6	Chair and Ranking Member, Parliamentary	Politician	National	Yes	Yes	4	3	N

	Select Committee on Local Government and Rural Development							
7	Member of Parliament, Ada	Politician	National (Region)	Yes	Yes	5	4	N
8	Members of Parliament, Keta	Politician	National (Region)	Yes	Yes	5	4	N
9	Member of Parliament, South Tongu	Politician	National (Region)	No	Yes	5	4	N
10	Members of Parliament, North & Central Tongu	Politician	National (Region)	Yes	Yes	5	4	N
11	Member of Parliament, Ketu South	Politician	National (Region)	Yes	Yes	5	4	N
12	Member of Parliament, Akatsi	Politician	National (Region)	No	Yes	5	4	N

	South							
13	Member of Parliament, Sege	Politician	National (Region)	Yes	Yes	5	4	N
14	District Chief Executive, Ada East	Politician	District	Yes	No	5	5	N
15	District Chief Executive, Ada West	Politician	District	Yes	No	5	5	Y
16	Municipal Chief Executive, Keta	Politician	District	Yes	No	5	5	Y
17	District Chief Executive, South Tongu	Politician	District	No	Yes	5	5	Y
18	District Chief Executives, North & Central Tongu	Politician	District	Yes	No	5	5	Y
19	Municipal Chief Executive, Ketu South	Politician	District	Yes	No	5	5	N

20	District Chief Executive, Akatsi South	Politician	District	No	Yes	5	5	Y
21	Ministry of Fisheries and Aquaculture Development/Fisheries Commission	Government ministry, department and agency (MDAs)	National	Yes	Yes	4	4	N
22	Ministry of Agriculture	Government ministry, department and agency (MDAs)	National	Yes	Yes	4	4	N
23	Ministry of Environment, Science, Technology and Innovation	Government ministry, department and agency (MDAs)	National	Yes	Yes	3	3	N
24	Environmental Protection Agency (EPA)	Government ministry, department	National	Yes	Yes	3	3	N

		and agency (MDAs)						
25	Ministry of Tourism, Culture and Creative Arts	Government ministry, department and agency (MDAs)	National	Yes	Yes	3	4	N
26	National Development Planning Commission	Government ministry, department and agency (MDAs)	National	Yes	Yes	3	3	N
27	Ministry of Finance	Government ministry, department and agency (MDAs)	National	Yes	Yes	3	2	N
28	Ministry of Local Government and Rural Development;	Government ministry, department and agency	National	Yes	Yes	3	3	N

	Town and Country Planning Department	(MDAs)						
29	Ministry of Gender, Children and Social Protection	Government ministry, department and agency (MDAs)	National	Yes	Yes	3	2	N
30	Ministry of Water Resources, Works and Housing (WRC; Hydrology)	Government ministry, department and agency (MDAs)	National	Yes	Yes	4	4	N
31	Ministry of Energy (VRA) ; Energy Commission	Government ministry, department and agency (MDAs)	National	Yes	Yes	3	3	N
32	National Disaster Management Organisation	Government ministry, department	National	Yes	Yes	3	3	N

	(NADMO)	and agency (MDAs)						
33	Ghana Statistical Service/National Population Council	Government ministry, department and agency (MDAs)	National	Yes	Yes	2	2	N
34	Ghana Climate Change Committee	Government ministry, department and agency (MDAs)	National	Yes	Yes	3	4	N
35	Forestry Commission	Government ministry, department and agency (MDAs)	National	Yes	Yes	4	4	N
36	Marine Police; Ghana Navy	Government ministry, department and agency	National	Yes	Yes	3	3	N

		(MDAs)						
37	Ghana Health Service/Ministry of Health	Government ministry, department and agency (MDAs)	National	Yes	Yes	2	3	N
38	Ada East DA	District Assembly	District	Yes	No	4	4	N
39	Ada West DA	District Assembly	District	Yes	No	4	4	Y
40	Keta Municipal Assembly	District Assembly	District	Yes	No	4	4	Y
41	North and Central Tongu DA	District Assembly	District	Yes	No	4	4	Y
42	South Tongu DA	District Assembly	District	No	Yes	4	4	Y
43	Akatsi South DA	District Assembly	District	No	Yes	4	4	Y
44	Ketu South DA	District Assembly	District	Yes	No	4	4	Y

45	District level officers in charge of Environment	District Assembly	District	Yes	Yes	3	4	Y
46	District level officers in charge of Water Resources	District Assembly	District	Yes	Yes	3	4	N
47	District level officers in charge of Disaster Management	District Assembly	District	Yes	Yes	3	4	Y
48	District level officers in charge of Social Welfare	District Assembly	District	Yes	Yes	3	4	Y
49	District level officers in charge of Gender and Children	District Assembly	District	Yes	Yes	3	4	Y
50	Assembly members	District Assembly	District	Yes	Yes	4	5	N

51	Traditional Authority – House of Chiefs and Queen-mothers	District Assembly	District	Yes	Yes	4	5	Y
52	Opinion Leaders	Community group	Community	Yes	Yes	4	5	N
53	Community Associations and Groups	Community group	Community	Yes	Yes	4	5	Y
54	Youth	Community group	Community	Yes	Yes	2	4	Y
55	Women	Community group	Community	Yes	Yes	2	4	Y
56	Fishermen	Community group	Community	Yes	Yes	2	4	N
57	Farmers	Community group	Community	Yes	Yes	2	4	N
58	Japanese Government	Development partners	National	Yes	Yes	3	4	N
59	UNDP/UNEP	Development	National	Yes	Yes	3	4	N

		partners						
60	Canadian Embassy	Development partners	National	Yes	Yes	3	4	N
61	UNU-INRA	Development partners	National	Yes	Yes	3	4	N
62	Netherlands Embassy	Development partners	National	Yes	Yes	3	4	N
63	FAO	Development partners	National/Local	Yes	Yes	3	4	N
64	GIZ	Development partners	National/Local	Yes	Yes	3	4	N
65	Danida	Development partners	National/Local	Yes	Yes	3	4	N
66	French Embassy	Development partners	National	Yes	Yes	3	4	N
67	AfDB	Development partners	National	Yes	Yes	3	4	N
68	World Food Programme	Development partners	National/Local	Yes	Yes	3	4	N
69	IUCN	Development	National/Local	Yes	Yes	3	4	N

	(International Union for Conservation of Nature)	partners						
70	SNV (Netherlands Development Organisation)	Development partners	National/Local	Yes	Yes	3	4	N
71	Ghana Wildlife Society	NGOs	National/Local	Yes	Yes	3	4	N
72	Care International	NGOs	National/Local	Yes	Yes	3	4	N
73	Ghana Red Cross Society	NGOs	National/Local	Yes	Yes	3	4	N
74	H3n Mpoano	NGOs	National/Local	Yes	Yes	3	4	N
75	Friends of the Earth	NGOs	National/Local	Yes	Yes	3	4	N
76	Abantu for Development	NGOs	National/Local	Yes	Yes	3	4	N
77	Religious Bodies Network (RelBoNet)	NGOs	National/Local	Yes	Yes	3	4	N

78	Earth Service	NGOs	National/Local	Yes	Yes	3	4	N
79	Peasant Farmers Association	NGOs	National/Local	Yes	Yes	3	4	N
80	HATOF Foundation	NGOs	National/Local	Yes	Yes	3	4	N
81	PAGE NC	NGOs	National/Local	Yes	Yes	3	4	N
82	Green Earth	NGOs	National/Local	Yes	Yes	3	4	N
83	ADRA Ghana (Adventist Development and Relief Agency)	NGOs	National/Local	Yes	Yes	3	4	N
84	Fisheries Alliance	NGOs	National/Local	Yes	Yes	3	4	N
85	Ghana National Canoe Fishermen Association	NGOs	National/Local	Yes	Yes	3	4	N
86	National Fisheries Association of Ghana	NGOs	National/Local	Yes	Yes	3	4	N
87	SEND Ghana	NGOs	National/Local	Yes	Yes	3	4	N
88	AtiDev	NGOs	National/Local	Yes	Yes	3	4	N

89	Arocha	NGOs	National/Local	Yes	Yes	3	4	N
90	The Development Institute	NGOs	National/Local	Yes	Yes	3	4	N
91	RIPS	Research Institutes	National	Yes	Yes	2	4	N
92	Institute for Environment and Sanitation Studies, UG	Research Institutes	National	Yes	Yes	2	4	N
93	Volta Basin Research Project	Research Institutes	National	Yes	Yes	2	4	N
94	Centre for African Wetlands (UG)	Research Institutes	National	Yes	Yes	2	4	N
95	Council for Scientific and Industrial Research – Water Research Institute (CSIR-WRI)	Research Institutes	National	Yes	Yes	2	4	N
96	Water Aid	Research	National	Yes	Yes	2	4	N

		Institutes						
97	Coastal Resources Center	Research Institutes	National	Yes	Yes	2	4	N
98	Water Resource Commission	Research Institutes	National	Yes	Yes	2	4	N
99	Dr Peter Acquah	Experts	National	Yes	Yes	2	3	N
100	Mr Seth Osafo	Experts	National	Yes	Yes	2	3	N
101	Mr William Agyemang Bonsu	Experts	National	Yes	Yes	2	3	N
102	Mr Fredua Agyemang	Experts	National	Yes	Yes	2	3	N
103	Mr Peter Dery	Experts	National	Yes	Yes	2	3	N
104	Prof Joseph Awetori Yaro	Experts	National	Yes	Yes	2	3	N
105	Mr Gerald Yiran	Experts	National	Yes	Yes	2	3	N
106	Dr Rose Mensah-Kutin	Experts	National	Yes	Yes	2	3	N
107	Dr. Emmanuel Obuobi	Experts	National	Yes	Yes	2	3	N
108	Dr. Delali Dovi	Experts	National	Yes	Yes	2	3	N

109	Ecobank	Private sector	National	Yes	Yes	2	3	N
110	Ghana Investment Promotion Centre	Private sector	National	Yes	Yes	2	3	N
111	Association of Ghanaian Industries	Private sector	National	Yes	Yes	2	3	N
112	Kumasi Institute of Technology, Energy & Environment (KITE)	Private sector	National	Yes	Yes	2	2	N
113	African Development Bank	Private sector	National	Yes	Yes	2	3	N
114	Social Security and National Insurance Trust	Private sector	National	Yes	Yes	2	2	N
115	Ghana News Agency	Media	National	Yes	Yes	2	2	N
116	Citifm	Media	National	Yes	Yes	2	2	Y
117	Local Radio	Media	Local	Yes	Yes	2	2	N

	Stations (Radio Ada and Jubilee Radio)							
118	Ama Kudom Agyemang	Media	National	Yes	Yes	2	3	N
119	Multimedia Group	Media	National	Yes	Yes	2	3	Y
120	Peace fm	Media	National	Yes	Yes	2	2	N
121	Radio XYZ	Media	National	Yes	Yes	2	2	N
122	UTV	Media	National	Yes	Yes	2	2	N
123	GTV/GBC	Media	National	Yes	Yes	2	2	Y
124	Daily Graphic	Media	National	Yes	Yes	2	2	Y
125	Ghanaian Times	Media	National	Yes	Yes	2	2	N
126	Ghana Palaver/Pravda Radio	Media	National	Yes	Yes	2	2	N
127	Ghana News Agency	Media	National	Yes	Yes	2	2	Y
128	African Adaptation Programme	Relevant Projects	National/District	Yes	Yes	1	2	N
129	ASSAR (Ghana	Relevant	National	Yes	Yes	1	2	Y

	country table)	Projects						
130	WASCAL	Relevant Projects	National	Yes	Yes	2	2	N

7.8. Appendix H: Stakeholder Engagement Strategy for the Volta Delta

STAKEHOLDERS	DETAILS	WHAT FORM	SPATIAL LEVEL	COMMUNICATION MODES
POLITICIANS	Chair and Ranking Member, Parliamentary Select Committee on Environment, Science & Technology	Political Will	National	Meetings; Emails; Phone calls; skits, audio-visuals
	Chair and Ranking Member, Parliamentary Select Committee on Lands and Forestry			
	Chair and Ranking Member, Parliamentary Select Committee on Poverty Reduction Strategy			
	Chair and Ranking Member, Parliamentary Select Committee on Works and Housing			
	Chair and Ranking Member, Parliamentary Select Committee			
				75

	on Defence and Interior			
	Chair and Ranking Member, Parliamentary Select Committee on Local Government and Rural Development			
	MP, Ada			
	MP, Keta			
	MP, South Tongu			
	MP, North Tongu			
	MP, Ketu South		National/District	
	MP, Akatsi South		“	
	MP, Sege			
	DCE, Dangme East			
	DCE, Ada West			
	MCE, Keta			
	DCE, South Tongu			
	DCE, North Tongu			
	DCE, Ketu South			
	DCE, Akatsi South			

			District	
			“	
			“	
GOVT MINIST RIES/DA / POLICY ANALYS TS/ BUREA UCRAT S	Ministry of Fisheries and Aquaculture Development/Fisheri es Commission Ministry of Agriculture Ministry of Environment, Science, Technology and Innovation Environmental Protection Agency (EPA) National Development Planning Commission	Policies, Laws Policies, Laws Policies, Laws Implementation Support Services on Environment and Climate Change	National	Emails; Newsletters ; Flyers; Meetings/W orkshops, skits, audio- visuals

			Policies, Planning Processes, Institutional Framework, Climate Change Mainstreaming	
	Ministry of Finance		Data on Climate Change/Adaptation financing	
	Ministry of Local Government and Rural Development; Town and Country Planning Department		Decentralised Planning (sub-district structures of town councils, zonal and unit committees)	
			Climate Change and Budgeting	
	Ministry of Tourism		Information on tourism sites, eco-tourism,	
			Policies & regulations	

		concerning movements		
	Ministry of Gender, Children and Social Protection		Gender issues, social welfare, vulnerable groups	
	Ministry of Water Resources, Works and Housing (WRC; Hydrology)		Management of water resources, estuaries	
	Ministry of Energy (VRA) ; Energy Commission			
	National Disaster Management Organisation (NADMO)		Energy consumption, types of energy available	
	Ghana Statistical Service/National Population Council		Disaster risk management	
	Ghana Climate			

	<p>Change Committee</p> <p></p> <p>Forestry Commission</p> <p></p> <p>Marine Police; Ghana Navy</p> <p></p> <p>Ghana Health Service/Ministry of Health</p> <p></p>	<p>Demographic data</p> <p></p> <p>Roster of expert groups</p> <p></p> <p>Wetland management</p> <p></p> <p>Security</p> <p></p> <p>Policy, information on health related issues</p> <p></p>		
	<p>Dangme East DA</p> <p>Ada West DA</p> <p>Keta Municipal Assembly</p> <p>North Tongu DA</p>	<p>Facilitation of community meetings</p> <p>Relevant background information</p>	District	<p>Workshops; Radio; Flyers, focus group discussions, audio-visuals</p>

	South Tongu DA Akatsi South DA Ketu South DA District level officers in charge of Environment Water Resources Disaster Management Gender and Children Social Welfare Assembly members	(Values, Belief systems, history etc)		
	Traditional Authority – House of Chiefs and Queen-mothers Opinion Leaders Community Associations and Groups Youth Women Fishermen	Partnership Community level expertise	Community/Local	Workshops; Radio; Flyers, audio- visuals, poetry, skits

	Farmers			
	Community members			
DEVELOPMENT PARTNERS	<p>Japanese Government</p> <p>UNDP,</p> <p>UNEP</p> <p>UNU-INRA</p> <p>Netherlands Embassy</p> <p>FAO</p> <p>GIZ</p> <p>Danida</p> <p>French Embassy</p> <p>AfDB</p> <p>World Food Programme</p> <p>IUCN (International Union for Conservation of Nature)</p> <p>SNV (Netherlands Development Organisation)</p>	<p>Information on similar projects</p> <div></div> <p>Sharing of best practices</p> <div></div> <p>Empowering people</p>	National	<p>Emails;</p> <p>Newsletters</p> <p>; Flyers;</p> <p>Meetings</p>

NGOS	Ghana Wildlife Society		National	Meetings; Emails; Phone calls; Flyers; Newsletters
	Care International			
	Ghana Red Cross Society		District	
	H3n Mpoano			
	Friends of the Earth		Community	
	Abantu for Development			
	Religious Bodies Network (RelBoNet)			
	Earth Service			
	Peasant Farmers Association			
	HATOF Foundation			
	PAGE NC			
	Green Earth			
	ADRA Ghana (Adventist Development and Relief Agency)			
	Fisheries Alliance			
	Ghana National Canoe Fishermen			

	Association National Fisheries Association of Ghana SEND Ghana AtiDev Arocha The Development Institute			
RESEARCH GROUPS	RIPS Volta Basin Research Project Centre for African Wetlands (UG) Council for Scientific and Industrial Research – Water Research Institute (CSIR-WRI) Water Aid Coastal Resources Center Water Resource Commission		National	Meetings; Emails; Newsletters
EXPERTS	Dr Peter Acquah	Expert advice on Climate Change,	Individual	Meetings; Emails;

	Mr Seth Osafo Mr William Agyemang Bonsu Mr Fredua Agyemang Mr Peter Dery Prof Joseph Yaro Mr Gerald Yiran Dr Rose Mensah-Kutin Dr. Emmanuel Obuobi Dr. Delali Dovie	Adaptation, Gender, Migration,		Phone calls
BUSINESS GP/PRIVATE SECTOR	Ecobank Ghana Investment Promotion Centre Association of Ghanaian Industries Kumasi Institute of Technology, Energy & Environment (KITE) African Development Bank Social Security and	Finance and Financing Information	National	Emails; Newsletters ; Flyers; Meetings, proposals, powerpoint presentation, audio-visuals

	National Insurance Trust			
Media (print and electronic)	<p>Ghana News Agency,</p> <p>Citifm,</p> <p>Local Radio Station (Ada and Jubilee)</p> <p>Ama Kudom Agyemang</p> <p>Multimedia Group</p> <p>Peace fm</p> <p>Radio XYZ</p> <p>UTV</p> <p>GTV/GBC</p> <p>Daily Graphic</p> <p>Ghanaian Times</p> <p>Ghana Palaver/Pravda Radio</p>	<p>Information & Dissemination</p> <div></div>	National, regional and community radio	<p>Emails;</p> <p>Phone calls;</p> <p>Meetings;</p> <p>Flyers,</p> <p>Workshops,</p> <p>Social media, talk shows or technical discussions</p>
OTHERS	<p>African Adaptation Programme</p> <p>ASSAR (Cross-consortia/country table collaboration in Ghana)</p>	Information, best practices	<p>National;</p> <p>Ended project</p> <p>National;</p> <p>Current project</p> <p>National;</p> <p>Current</p>	<p>Emails;</p> <p>Meetings</p>

	WASCAL		programme	
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Contributing Partner Institutions



Bangladesh University of Engineering and Technology (BUET)



Jadavpur University, Kolkata, India



Centre for Environment and Development, India



Chilika Development Authority, Orissa, India



University of Ghana